JOURNAL OF ELECTRICITY POWER AND GAS

TELEPHONE NUMBER

Devoted to the Conversion, Transmission and Distribution of Energy.

Entered as second-class matter May 7, 1906, at the Post Office at San Francisco, Cal., under the Act of Congress March 3, 1879

VOL. XXII NO. 2 | SAN FRANCISCO, JANUARY 9, 1909 | PER COPY, 10 CENTS

ELECTRIC APPLIANCE COMPANY — THE QUICK SHIPMENT HOUSE

726-728-730 Mission Street
San Francisco

OKONITE WIRE

OKONITE — TRADE MARK REG. U.S. PATENT OFFICE.

THE STANDARD for RUBBER INSULATION

Okonite Tape, Manson Tape,
Candee Weather-Proof Wire,
Candee (Patented) Potheads.

THE OKONITE COMPANY, LTD.

253 Broadway — NEW YORK

PARANITE

INDIANA RUBBER AND INSULATED WIRE CO.

Manufacturers of Paranite and Peerless Rubber Covered Wires and Cables
Underground, Aerial, Submarine and Inside Use
Telephone, Telegraph and Fire Alarm Cables
All Wires are Tested at Factory JONESBORO, IND.

Electric Appliance Company
728 Mission St., San Francisco — Pacific Coast Agents

Standard Underground Cable Co.

MANUFACTURERS OF

BARE AND INSULATED WIRE AND CABLES

Chicago, New York, Pittsburg, Boston, Philadelphia, St. Louis, Atlanta, San Francisco

PACIFIC COAST DEPT. --- A. B. Saurman, Manager
Sub-Office—Los Angeles, Cal. — Shreve Bldg., San Francisco

Phillips Insulated Wire Co.

PAWTUCKET, R. I.

"O.K." WEATHERPROOF
"PARAC" RUBBER COVERED

COMPLETE STOCKS CARRIED BY
OUR PACIFIC COAST AGENTS

California Electric Co. LOS ANGELES — Electric Appliance Co. SAN FRANCISCO — Western Electric Co. SEATTLE

Specify....

BROOKFIELD GLASS INSULATORS

The Standard

PACIFIC METER CO.

MANUFACTURERS OF

Wet and Dry Gas Meters, Station Meters, Provers, Guages, Etc.

301 SANTA MARINA BUILDING
California and Drumm Sts. — San Francisco

VULCAN ..... Refrigerating and Ice Making Machinery

MANUFACTURED BY

VULCAN IRON WORKS

Office: 702 Atlas Bldg., 604 Mission St.
Works: Francisco and Kearny Streets — San Francisco

FOR INDEX TO ADVERTISEMENTS SEE PAGE EIGHT

Art and Nature

Everything is Art which is not Nature

Lighting is an Art

When Nature's Sunbeams fail, let

Sunbeam's Sunbeams

carry on the work

The New Building of Roos Brothers in San Francisco is lighted with EIGHT HUNDRED SUNBEAM TUNGSTEN LAMPS

Building of Roos Brothers, San Francisco

No light equals the pure white light of the SUNBEAM TUNGSTEN for exhibiting the delicate colors and weavings of choice fabrics

SUNBEAM INCANDESCENT LAMP CO., Chicago -- New York

WESTERN ELECTRIC COMPANY

SAN FRANCISCO SEATTLE LOS ANGELES

New Welsbach "Reflexolier"

THREE LIFHT "REFLEXOLIER"
A Perfect Light for Stores and Offices

MAXIMUM LIGHT AT MINIMUM COST

DESCRIPTION

The "Reflexolier" is a cluster of 2, 3 or 4 of the well known inverted "Reflex" lamps, arranged on a scientifically designed pendant fixture. The igniting device is of the pilot type and is operated by a chain pull.

ILLUMINATION

The illumination from a 3-light Reflexolier suspended 12 feet from the floor, in the center of a room 20 feet square, will give a light on a table directly beneath the fixture of 4.42 foot candles, and on a table at the side of the room of 1.39 foot candles. The illumination from a 60-watt Tungsten 5-light cluster suspended 12 feet from the floor in the center of the same room will give a light on a table directly beneath the fixture of 2.8 foot candles, and on a table at the side of the room of 1.2 foot candles. (Holophane Advance Bulletin No. 8.)

COST OF OPERATION

A "Reflex" lamp consumes 3⅓ feet of gas per hour---10 feet for a 3-light "Reflexolier." Assuming that three hours daily is a fair average use of artificial light, the gas consumed for 30 days would be 900 feet, plus 216 feet consumed by continuous burning of the pilot lights, or a total of 1,116 cubic feet of gas for 30 days. The 60-watt Tungsten lamp is the lamp in general use and consumes 60 watts per hour---300 watts for a cluster of 5; on the above basis the total consumption would be 27,000 watts for 30 days.

Prices and Candle Power Readings Sent on Application

Welsbach Company

351 McAllister Street, San Francisco

JOURNAL OF ELECTRICITY
POWER AND GAS
Devoted to the Conversion, Transmission and Distribution of Energy

VOLUME XXII. SAN FRANCISCO, JANUARY 9, 1909 NUMBER 2

THE FIRST UNDERHUNG INSULATORS

By A. S. Kalenborn

When the new type of underhung, high-tension insulator was introduced, most of us were impressed by the radical change from the old pin-supported type, and, no doubt, considered the idea of underhanging as quite original and entirely new.

During a recent trip into the Sierras in the vicinity of Lake Tahoe, I came across the antiquated, almost forgotten prototypes of these new high-tension insulators. One of these used by the Central Pacific Railroad is quite an elaborate piece of work, consisting of three separate parts, which are cemented together with sulphur, and an additional iron pin or spike to secure the combination within the cross-arm. A thin cast-iron cup with a lug near the closed end was secured, open end downward, within the arm by a pin, as indicated in the line drawing. Within this, cemented by means of sulphur, was an open-mouthed bottle of glass, and "sulphured" within the bottle was the hook for holding the wire.

Figure 1 shows the arm and the method of supporting the insulator. The wire was held without a tie by being bent into the hook, the kink formed thereby preventing displacement or slipping. The arms were treated with some preservative, apparently bitumen, and are in good condition, although they have been exposed to the weather for many years.

On the top of the enclosing cast-iron cylinder of the insulator, which, with the pin, is heavily galvanized, are the words, "Brooks' Pat. August 6, 1867." It seems, therefore, that before some of us were born these underhung insulators were out in the world doing an important work.

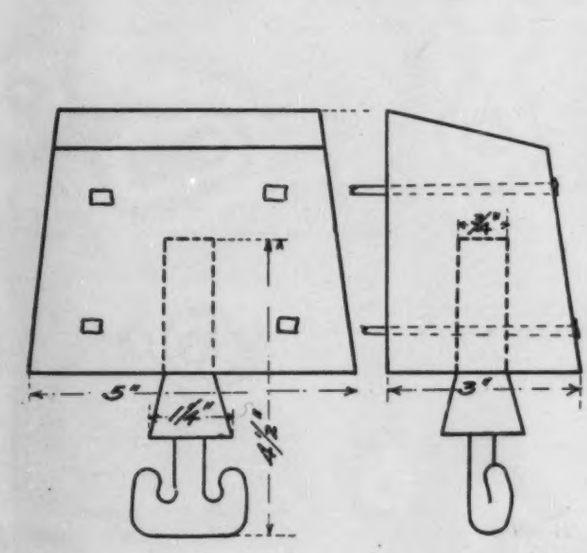
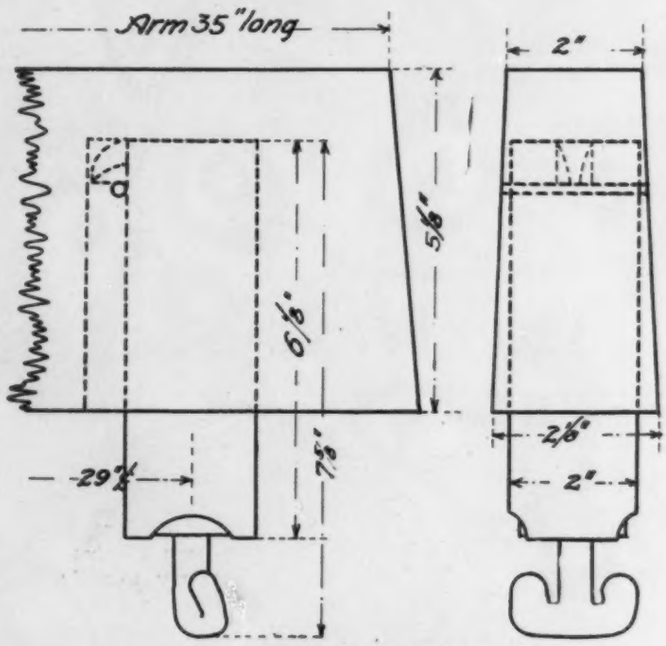


Fig. 1. Western Union Insulator.



Central Pacific R. R. Insulator.

Later the glass pin-supported insulators superseded these at considerably reduced cost.

The other type of telegraph insulator is simpler, smaller, and of less cost and weight than the first, as it weighs complete only 5 ounces, as compared to 1 pound 10 ounces for the larger one.

This one, which was used on the Western Union line along the wagon road from Truckee to Lake Tahoe, and which, as shown, consists of only two component parts, the galvanized iron hook and a rubber sleeve cast onto the shank. The sleeve being threaded was screwed into the under side of an arm or block secured to a pole or a tree. The Truckee-Tahoe line was run through the forest, and

small blocks, as shown, were nailed to the trees, the bark of which has in many instances almost enclosed them at this date.

Around the shank, apparently stamped into the rubber, are the words, "Goodyear's Patent. May 6, 1851," which takes us back to the very early days of the telegraph, or eighteen years prior to the laying of the first transatlantic cable.

Thus we see that our "newest" insulators are in reality but a modification of the earliest ones, and the principle long discarded is the one which solves the problem of utilizing extra high voltages.

HANDLING OPERATORS.*

The question of operators' loads, or the average number of calls that an operator should handle, is one which is probably asked oftener than any other question pertaining to operating. This question is often asked for comparison, sometimes for information, and it is really one which every one has to answer for himself. No one can tell another how many calls his operators should handle per hour, unless he is thoroughly familiar with the conditions. He can say about so many, and be very close, but the number of calls which an operator can handle or the average number that operators are loaded to for a busy hour can only be determined by careful loading and observation. Conditions govern this figure entirely. A single office system, straight work, and a short reach would naturally permit the handling of more calls by an operator than one where there is trunking to do, various kinds of service, etc. Further than that, the standard average answering service to be maintained must also be considered where determining the average number of calls the operators are to handle during the busy hours. Operators do their best work when they are given just enough to keep them busy, and not so much that they are always rushed.

A great many methods of testing operators are used, and they all are good, but some are better than others for the reason that they are more complete and more information can be gotten, and consequently better results. Listening desks, observation desks, and all apparatus of this kind are very good and quite necessary, even in the smallest offices, but they must be used constantly to be of any great value. The operators' errors and faults are found out by means of this apparatus, and to get results from this information it is best, or at least quicker results can be obtained, by taking them up with the operator at once.

Too much attention cannot be given to the testing of answering service. This in itself does not mean all that there is to good service, but it goes a long way toward making it up. Answering tests cannot be made too often, and to maintain a good answering time it is necessary to keep up the testing daily. It is not necessary that the answering time alone be tested. All the conditions that a subscriber may meet should also be tested, and this can be done in connection with the answering test. In large exchanges the all-night test should be kept up as well as the day or evening test, and in exchanges where this has not been done, or to those who have not had some experience, the tests for the first few nights may be a little surprising.

In a modern common-battery exchange of any size, the average answering time for the day and evening hours should be kept under four seconds, and with regular testing and good supervision this can be done.

*Extract from paper on "Local Traffic," presented at the convention of the International Independent Telephone Association, Dec., 1908, by A. J. Shands.

THE LEGAL STATUS AND RELATIONSHIP OF INDEPENDENT TELEPHONE COMPANIES.*

By A. C. Lindemuth.

Hitherto little attention has been given by this association to the consideration of legal questions affecting independent telephone companies as a whole and as to their relationship with each other. Individual companies have looked after their own legal matters in their own way, and naturally their investigation and concern have rarely extended beyond their own immediate interests. This will account for the lack of information upon these broader questions, the importance of which every layman felt, but in which, of course, he was not expected to be versed. This, too, may be one reason why associated independent companies have been somewhat tardy in asserting their rights under the law. During the last year some considerable investigation has been given to these important legal propositions, and steps have been taken, or are about to be taken, which will result, I apprehend, in ascertaining and making known more clearly the relative rights, duties, and liabilities of independent telephone companies for the benefit of all. It is impossible, of course, in a short paper like this to consider many of these questions, or to discuss them at much length. At most, I can only hope to plainly and concisely present a few important and interesting points. Nor, at this time, shall I cite the decisions in support of them, although many of the propositions have been briefed and authorities thereon fully collected, and tabulated for ready reference when occasion arises.

Interests Involved in the Operation of a Telephone Plant And Their Reciprocal Rights and Duties.

In the operation of every commercial exchange, three interests are involved, which have reciprocal legal rights and duties. These three interests are the management, the investor, and the public. There is still a fourth interest, and an important one with respect to independent telephone companies, which I shall discuss as a separate proposition, namely, the legal relationship between associated or connecting independent companies.

It is the law that the officers and employees who constitute the management or administrative side of the business have a right to just compensation for service rendered, and in return therefor they owe a legal duty to the investor and the public to give the company their best skill and efforts, and this means that the most efficient results shall be attained at the least possible cost. This rule of law applies equally to the management of the company's affairs in all its branches, whether purely administrative or whether relating to the physical property, such as maintenance, operation, or construction. High efficiency economically attained is their legal bounden duty, and their right, fair compensation.

The investor who furnishes the capital with which to construct and develop the utility for the public convenience is by law entitled to the security of his investment and a fair return thereon. Too often the investor is regarded by the public in an unfriendly attitude. There is neither ground for nor benefit to be derived by any one from this. Without capital, public utilities cannot be constructed, and without them modern business conditions could hardly go on; therefore, the safety of the investment must be absolutely assured, and the return thereon reasonably adequate to attract capital. If the people are to have these utilities, the interest of the investor must be considered in the fixing of rates.

In all legal controversies upon the question of rates the right of the investor to a fair return on his investment is

*Paper read at the convention of the International Independent Telephone Association.

considered and fully recognized by the courts, as it should be. And so, in States where the authority to fix rates is vested in utilities commissions, the same rule of law is applied in the determination of what a reasonable rate should be.

The public, under the law, have a right to the best possible service, and owe a duty therefor to pay a reasonable rate. The service, of course, is dependent upon the kind of plant, the state of repair in which the same is kept, and the efficiency of operation. The character and cost of construction should be adapted to the size of the town or city, the ability of the people to pay for telephone service and such as will justify the investment. The law would not expect or require the same degree of efficiency in service in small towns and villages as it would in larger towns and cities, unless as a practical proposition such efficiency could be obtained with simpler and less expensive equipment. So, too, the law would regard as unreasonable and therefore would not enforce a regulation on the part of a town or village requiring a telephone company to put in underground conduit or other expensive construction.

The Relationship of Independent Telephone Companies with Respect to Each Other.

The relationship of independent telephone companies to their connecting independent telephone companies and other associated interests has never, in my judgment, been fully understood or considered. The use of the word "sentiment" to indicate this relationship is, it seems to me, a very mild expression for the mutual obligation existing between them. There is, it is true, a "sentiment" in maintaining independent relations when once assumed, and a moral obligation also, but there is something more than this. There is, in my opinion, a legal duty and liability. No sound business man would undertake to run a business on sentiment alone, nor would he admit sentiment to enter as a material factor in the ownership or control of the business property. The telephone business, while possessing many peculiarities, should be no exception in this regard, and in treating the relationship existing between independent companies as a sentimental one, we have overlooked the stronger and more practical obligation, and thus materially weakened our position. This mistaken idea has furnished an easy excuse for certain independent companies which have disregarded their legal obligations to the other independent companies, and connected up with the rival system, and for any who may be considering such a connection.

This relation of one independent company to its connecting independent companies constitutes an implied contract whose breach involves not only bad business faith, but also, as I believe, a legal liability. In fixing the legal status of connecting independent companies with respect to each other, four elements are to be considered.

The relationship of the independent company (1) to the charter granting power, (2) to its subscribers, (3) to its security holders, and (4) to its connecting independent companies.

When practically every independent telephone company was organized, it was organized and held itself out to the public as an independent company in competition with its rival system. This was, as a rule, plainly made manifest in the articles of incorporation, the ordinances and franchises, the literature and advertisements, by the public declarations.

1. When it procured its franchise from the charter-granting power, whether from the State or municipality, it procured the same mainly upon its representations that it was an independent company—that is, independent of the then existing company—and was organized and intended to be operated in opposition to and in competition with such existing system. In fact, this was the main, if not the sole, consideration for the grant. In granting the franchise, the State or municipality had in contemplation the establishment of a competing telephone system. The reduction in rates, the limitation in the term of the franchise, the provisions for improved and increased telephone facilities, almost universally appearing in the grant indicate this, and in perhaps the majority of cases there was inserted a specific clause, absolutely prohibiting the assignment of the rights thereunder to any existing or competing company without the consent of the charter-granting power.

But even if not in any manner expressed in the grant, it was a matter of general notoriety, provable in a court of law by acts and declarations at the time the franchise was asked for and obtained, that the main consideration therefore was to secure to the people the benefits of competition in telephone service. What the telephone conditions were in the United States prior to the origin and development of the independent movement have been so often told and are too well known to need repetition here. It is sufficient to say that the telephone business was in the hands of a monopoly, the rates were exorbitant, the service poor, the company exclusive and unprogressive, and the treatment of the public by it arbitrary, dilatory, and discourteous. The independent movement was general throughout the country, and the literature of the times on the necessity and cause for its existence would fill many volumes. The impelling motive in all these grants of franchise and telephone privileges to independent companies was competition.

A desire to secure to the people by and through competition, the benefits of reasonable rates, superior service, the stimulation of rivalry in invention, improvement in equipment, and perfection in the art of its operation; also a large development of the field and a greater extension of telephone facilities to the residential and outlying districts of cities and towns, villages and rural communities, and all the other benefits which naturally flow from competition. But for these the grant would undoubtedly not have been made. The city council or town board would not have given another and additional franchise to the existing company, which already had one plant installed, for without competition no substantial benefits could have flowed from such grant. In fact, bonds were exacted from many independent companies that actual work should be begun within a certain time, and great caution was taken that such franchises should not be left open to become the subject of barter and trade with the rival system. And what was the purpose of all this if not to make sure that competition was not only to be established, but to be maintained? Independence and competition were therefore indelibly impressed upon their charters, and gave legal significance to their relationship to the charter-granting body.

Hence the relationship of the independent company to the municipal corporation, or franchise-granting power, constituted not a mere sentiment, but a contract either express or implied and enforceable in law, and was based upon competition as the main consideration for its establishment.

The benefit of competition was a very important and valuable consideration, not only adequate to support the grant, but irrevocable by the one without the consent of the other. It is both law and reason that that which was the chief consideration for the public rights and privileges secured, cannot be set aside or avoided at the will or pleasure of the telephone company.

2. When the independent company solicited and procured subscribers to its exchange, it did so holding itself out and representing itself as an independent company in competition with the old company. In doing so it created a legal obligation between itself and the subscriber to so maintain itself. Invariably it offered reduced rates, better service, fairer treatment, and its connections as a part of the independent system as inducements for their patronage, and these were the very expressions of competition and the very benefits to flow therefrom.

The telephone patron has a dual protection for his rights and interests in the company's service: his interests as a citizen, which are represented by the municipality or town board, and the other by his individual contract, express or implied. Under his individual rights, the independent company cannot lawfully substitute another and a different service from that expressly or impliedly contracted for, or otherwise vary its obligations to its subscribers without his consent.

3. When the independent company placed its securities on the market and sold its stock or bonds, it did so as an avowed independent company, in competition with the old and existing company. Even if no positive or direct representation were made at the time, the purchaser knew, or had a legal right to take notice of, the public acts and declarations of the company and those in control, and was likewise bound to know the nature and obligation of the grant and the interests of the public in the maintenance of competition. The relationship to an implied contract of the company with the charter-granting power, the subscribers, and the connecting independent companies were facts of which the security purchaser was bound to take knowledge, and he took his securities subject to their pre-established rights.

On the other hand, if this independent status and relationship so openly assumed and avowed by the company imparted strength and value to the securities, the security holder, whether stock or bond owner, has a legal right to have that status and relationship maintained, unless altered by law. This right has not to my knowledge been asserted in any instance, yet when security holders begin to realize that their stocks and bonds may become imperiled by the surrender of the independent company to its rival and the destruction of competition, he will no doubt be heard from in the courts.

The interests of the minority stockholder are now about to be tested in the Dubuque, Iowa, case, and there is ample support in law for the protection of his rights by appealing to the courts to prevent the independent company from deserting its independence and destroying competition by an illegal merger, and thereby depreciating or destroying the value of his stock.

In my judgment, when an independent company, having held itself out and represented itself to be an independent company, in competition with the old or opposition company, secures its franchises under such representations, sells its securities under such representations, then connects up with other independent companies as a part of the independent system, the connection of the one company is a good consideration for the connection of the other, and there is thus created an implied contract and a legal obligation to maintain the independent and competitive status, and a legal liability when such obligation is violated, and this, in my opinion, is true even in the absence of an express or exclusive contract.

There is a familiar rule of law in relation to partnerships that one who himself holds as a partner, allowing his name to be used on the signs and stationery of the firm, is estopped from denying his relationship and is liable for the firm's debts, even though he is not a partner and has not a dollar of interest in the firm. So, too, when one party grants a license to another to build certain constructions on his premises for certain purposes, and on the strength of such license and in pursuance thereof enters into contracts and incurs expenses on account thereof, the property owner may revoke such license, but he must make whole the licensee for his losses, even though the license was gratuitous.

There is a general rule analogous to these principles which applies, in my opinion, to the connections of independent companies with each other as a part of the independent system. When a party holds himself out or represents himself to be in a certain state, relation, or condition whereby the other party deals with him upon the faith and credit of such pretensions, and incurs obligations or expenses on account thereof, the first party is estopped from denying such state, relation, or conditions, and is legally bound to maintain the same or respond in damages for an infraction of such legal duty.

Therefore, when an independent company connects up with another independent company as an independent company in competition with their common rival, as indicated above, and a business is built up between them, then, in my opinion, they are bound in law to maintain such relation or stand liable in an action for damages for a breach of such implied contract. The position of an independent company as an independent competitive company and as an integral part of the independent system with its independent connections and business relations is a valuable consideration to support such an implied contract, and constitute an important asset whose value can hardly be realized by one not conversant with the telephone history and the nature of the telephone business.

That an exclusive contract, that is, a contract for independent connections only, and the delivery of the entire business of the one company for the territory of the other, exclusively to the other company, for a term definite, is a valid and binding contract enforceable in law, has now been decided in four of the lower courts: by Judge Matthias, of the Court of Common Pleas of Van Wert, Ohio, on Oct. 12, 1908, in the case of the United States Telephone Company vs. the Middle Point Home Telephone Company; by Judge Quayle, of the Common Pleas Court of Allen County, Ohio, on the 28th day of July, 1908, in the case of the United States Telephone Company vs. The Delphos Telephone Company; by the Supreme Court of Wayne County, New York, on the 14th day of September, 1908, in the case of Wayne-Monroe Telephone Company vs. Ontario Telephone Company and the Empire State Telephone & Telegraph Company; also in a much earlier decision by the Wabash Circuit Court of Wabash County, Indiana, rendered on the 5th day of May, 1906, in the case of The North Manchester Telephone Company vs. The Eel River Valley Telephone Company. In no case has there been a decision to the contrary.

In these cases the rival company set up the plea that such exclusive contracts were in restraint of trade and tended to create a monopoly and were therefore void. But the courts held that such exclusive contracts when not made between competing systems were, in fact, an aid of competition, and perfectly valid. It is manifest that this must be so, for the very purpose of such exclusive contracts for connecting up and interchanging business between independent telephone companies was, and is, to build up and maintain an organized system in commercial rivalry with the monopolistic system. There could be no real and effective competition under universal connections. Hence the courts could not have decided otherwise on principle, and the decisions of the courts in these cases are so well supported by analogous authorities that I have no doubt they will be sustained by the higher courts.

Telephone Companies Common Carriers.

While a telephone company is not, in the strictest and most comprehensive sense of the term, a common carrier, it is now fairly well settled by the authorities that telephone companies, like telegraph companies, are "Common Carriers of News, Messages, or Intelligence." They are not subject to the extraordinary limitations, obligations, and responsibilities imposed by law upon railroads, express companies, and other well-recognized common carriers, nor are they insurers of service, as are some other common carriers, nevertheless their commercial status is so similar to other common carriers that they are regarded in law and treated by the courts as common carriers of news.

The decisions giving to telephone and telegraph companies this legal position are now so numerous as to take the question beyond the field of controversy.

Telephone Companies Also Public Service Corporations.

Telephone companies are also public service corporations, otherwise designated as "quasi-public corporations" or "public utilities"; that is, their duties are of a public nature, although they are organized for private gain, and their stock and property are private possessions. They are, therefore, neither wholly public nor wholly private, but partake of the nature of both, hence the term "quasi-public" as applied to them. Being created for a public use, they are clothed with the extraordinary powers of eminent domain, that is, the right to condemn private property to carry out the purposes for their existence.

As to Duties of and Physical Connection between Telephone Companies.

Telephone companies being common carriers and public service corporations, they are therefore charged with certain duties to the public. They must exercise due care, skill, and diligence in the selection of all their equipment, tools, and appliances for the purpose of rendering good and efficient service and safeguarding the public and their employees from personal injury and their property from damage. They must also exercise such due care, skill, and diligence in the selection of their employees and in the construction, maintenance, and operation of their telephone system to the same end of safety and efficiency. Owing, however, to the delicacy of electrical apparatus and its susceptibility to disturbance and interference by the natural elements and other uncontrollable causes, they are not held in law as insurers for the safe and accurate transmission of messages, nor to that efficiency and continuity of service that may be required of other similar corporations.

But it is not my intention here to go into a consideration of these questions of corporate liability, but rather to discuss the broader questions affecting the independent telephone business as a whole.

As such common carriers and public service corporations, telephone companies are subject to an important rule of law governing all like corporations; that is, they are bound to serve the public with impartiality. They may classify the service according to quantity or cost of service, or by any other reasonable distinctions, for the purpose of graduating rates, but their service must be open to all. They must furnish instruments and service without discrimination to all who are willing to pay the charges and abide by the company's rules and regulations.

Under this law, one telephone company may be, and undoubtedly is, bound in the ordinary course of business to furnish another telephone company with one of its telephones in the other's office or exchange, and render it service in the ordinary business way subject to the reasonable rules and regulations of the company furnishing the service, the same as an individual, or to a telegraph company or other class of business; but such telephone company could not be compelled to furnish its instruments and service to a rival company to be used in competition with itself, either connected up or disconnected with its own system, nor in a special way, to its detriment. The latter is another and a very different proposition from the former and is not embraced within the principle of discrimination nor under the duties of common carriers or public service corporations.

Nor, under the law as it now exists, can one telephone company be compelled to connect up and interchange business with a competing company. As stated by the court in one case, the duty of a telephone company "is to the public and not to another and competing common carrier. One common carrier cannot demand as a right that it be permitted to use a rival common carrier's property for the benefit of its own business." Another court has said that "one telephone company cannot be forced to afford the facilities which it has provided for its own business to its rival to be used in competition with itself." Still another court has decided "that a reasonable construction of the law does not require a telephone company to furnish to another company connection with its system, to be used by the latter as a part of its own system, upon payment of the ordinary subscriber's tariff." That the courts have no power to enforce physical connection and interchange of business between competing telephone companies is, in my opinion, well established by the authorities. In the language of the court in the Express Company case, "the regulation of matters of this kind is legislative, not judicial." To what extent this legislative power exists, the court, however, expressly stated "that it did not undertake to decide."

That a telephone company, being a public service corporation, clothed with the power of eminent domain and subject to many of the duties of common carriers, is subservient to legislative control, cannot be questioned. Such legislative control, however, cannot invade constitutional rights. The national Congress or State Legislatures may exercise their police powers over telephone companies and may regulate them in the interest of the public welfare, but always within constitutional limitations. The public health and public safety and the public convenience may be subserved by legislative enactment, though not to the extent of overturning vested rights or confiscating property. The language of the court, in a case at hand, states the propositions plainly: "The only limitation upon the legislative power is that the duty imposed must relate to a matter which is within the domain and properly a subject of police regulation, and must be reasonable in its requirements." Telephone companies may be compelled to adopt certain safeguards and appliances to protect the public from accidents, telephone rates may be regulated within certain limits, messenger service may be required for public convenience, but the property and service of one telephone company cannot be taken from it and turned over to its rival without due process of law and just compensation under the constitution.

Act of the constitution of the United States provides: "No person shall be deprived of life, liberty, or property without due process of law; nor shall private property be taken for public use without just compensation."

That the property of a telephone company used in giving service to the general public for hire is devoted to a public use within the meaning of the constitution, is well established by the authorities, both State and federal, and therefore can no longer be a subject for discussion. The only question then remaining, and which has not been decided, is: "Does a law enforcing a physical connection of the wires of competing telephone companies and compelling them to interchange business constitute a taking of private property within the meaning of the constitution of the United States?" That the property of a telephone company, though devoted to a public use, is private property, I have already stated, and is equally well settled by the decisions. Is there, then, a taking?

Such a taking does not necessarily mean a deprivation of ownership or control over the property; but an appropriation of the use of the property of the one by the other, either in whole or in part, without the consent of the owner, may also constitute a taking under the law. Let us see what an enforced physical connection and interchange of business means.

Compulsory physical connection involves an entrance upon the pole line, conduit, or right of way of one company by the rival company; it means the actual cutting of the wires of the one company by its competitor, and the actual welding or uniting of the competitor's wires thereto; or, in place of this, it means an actual entrance upon the

premises of the one company by the rival company and the placing of its wires into and upon the distributing frame and switchboard of the other company, with separate drop, fuses, and appliances to accommodate that particular circuit. In either case it constitutes an actual physical entrance upon the private right of way or premises of the one company by the other, and the physical fastening of the one company's property to that of the other. This certainly would constitute a taking possession of, and therefore a legal taking of, the property of the one company by the other to its own use. But compulsory connection alone would be of no avail without compulsory interchange of business. This involves still more. It means not only the use of the pole line, wire, drops, fuses, and other physical property taken, but also the appropriation and use of the same and a continuous electric current, the services of the operators, and, in addition thereto, access to the individual telephones of all subscribers, who are under contract with that company, and whom the company has been under considerable expense to procure, and which constitute its most valuable asset. It means also the burdening of the wires and switchboard of the one company with the business of the other and the necessary interference with the business of such company; for while the lines are busy with the one, they cannot be used by the other, and are as effectually barred to the owner as a stranger would be to the property of another. If such devotion of the private property of one to the use, benefit, and profit of another, and a rival in competition with itself, does not constitute a taking of property within the sense of the constitution, it is inconceivable what would constitute such a taking outside of actual larceny.

In three States, I believe, the Legislatures have passed laws authorizing enforced physical connection and interchange of business between telephone companies. In at least one of these States this legislative enactment is backed up by a constitutional provision, but in neither State has the statute been attempted to be enforced or its constitutionality been tested in the courts. Aside from the constitutional objection above raised, I doubt whether such a law would be valid and enforceable between competing telephone companies. For the rule of law is well established, I think, that where the policy of the State is opposed to monopolies, such a law would have to be restricted to telephone companies not in competition with each other. In other words, the law authorizing such physical connection and interchange of business would have to be read in the light of and in connection with the expressed avowed policy of the State, and be constructed in such a way as would not destroy competition and create or tend to create a monopoly.

In two or three railroad cases laws have been held valid enforcing the construction of connecting switches and an exchange of freight between intersecting railroads; but it appears to me that this condition is essentially different from that of two competing local telephone exchanges which occupy the same territory, and whose main asset and stock in trade is their system of subscribers and their rival connecting exchanges. What might be a reasonable regulation with respect to intersecting railroads would certainly be unreasonable if applied to telephone companies, and a careful analysis of the authorities will, in my opinion, bear out my contention.

Illegal Mergers and Combinations.

Illegal mergers and combinations of competing telephone companies were made the subject of a former address, and it is not intended to go into the matter here. Since then many forms of the question have been investigated, the legal authorities collected, and in pursuance with the conclusions reached thereon, several important actions have been commenced in the courts, and other steps taken toward the undoing and nullifying of the effect of these unlawful combinations and bringing violations of the law of this kind to the notice of the proper authorities.

Many important legal questions are still unsolved that should be thoroughly investigated and determined for the good of the general cause. No doubt, too, during the coming winter many bills will be introduced in the legislatures of the various States, injuriously or beneficially affecting the independent telephone interests, that should have the constant and skillful care of the association. The law as it now exists, if fully and persistently invoked, will sustain the integrity of the independent system—the most beneficial and popular telephone service in the land.

CABLE TO BRAZIL.

Consul-General George E. Anderson, of Rio de Janeiro, advises that the proposed concession to German interests from the Goverment of Brazil for the laying of a new telegraph cable between Brazil and Europe and South Africa, which has been pending for something over a year, has finally been granted by the Brazilian Government.

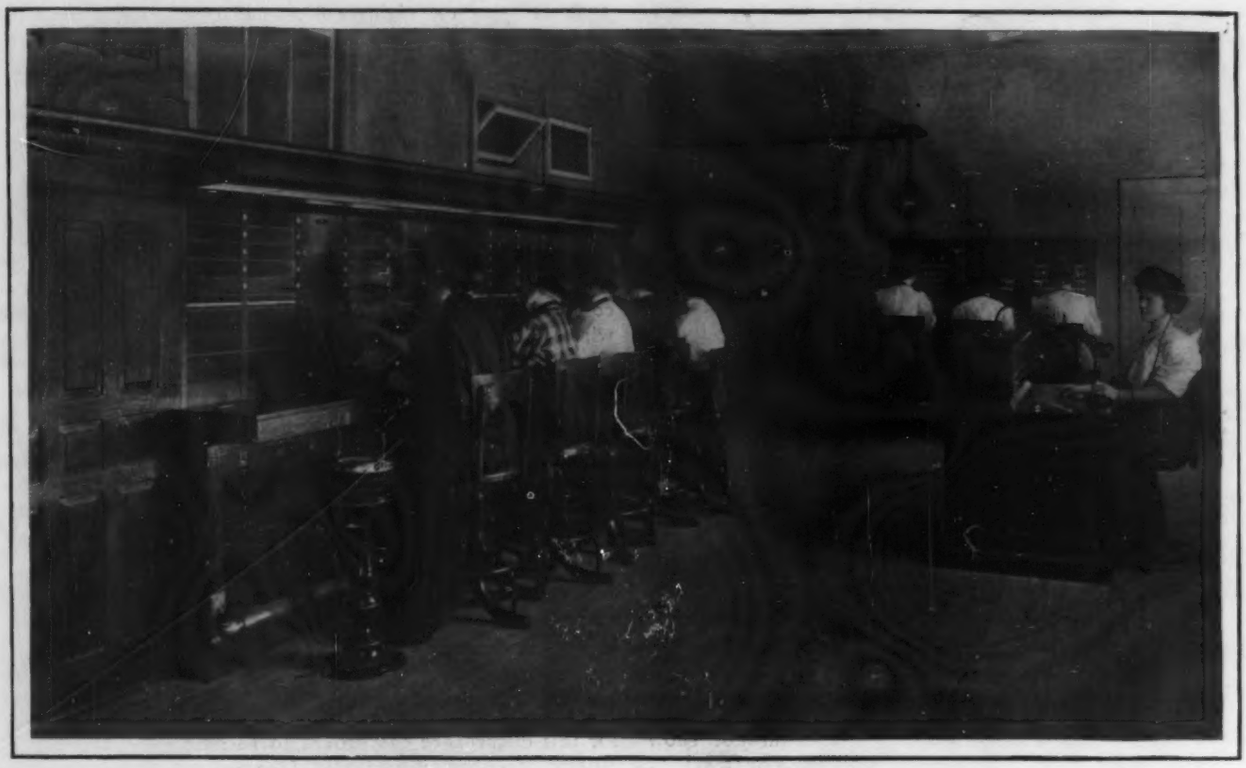
The concession is made to the Felten und Guillaume-Lahmeyerwerke Actien-Gesellschaft, of Mulheim on the Rhine, in a presidential decree, effective October 27. A cable is to be laid from either Pernambuco or Maceio in Brazil, to Teneriffe Island, and, in connection with arrangements to be made with the South American Cable Company, to the west coast of Africa. The concession is granted without time limit, except that the cable must be in operation within three years. The company is to pay the Brazilian Government 10 centimes (about 2 cents) per word on all its business sent or received, and deposits 50 contos of reis (about $15,000) with the Brazilian Government as a guaranty for the performance of its part of the contract. The company must pay for the inspection of its service and accounts by the representative of the Government, give Government business preference over all other, and also give the Government a discount of 50 per cent on its messages. The company also agrees to forward messages from Brazil to Europe for at least 60 centimes (about 12 cents) less than the present cable companies are charging. The provisions as to the forfeiture of the contract, and the regulations under which the service will be given, are those usual to such concessions the world over.

For the operation of this cable there has been formed at Cologne, Germany, the Deutsch Sudamerikanische Telegraphen Gesellschaft, with a capital of 4,000,000 marks ($952,000). The plans of the company, as announced, include the laying of a cable from Germany to Teneriffe, thence to Liberia and German West Africa and German Southwest Africa, and from Teneriffe to Brazil. The German Government is granting a subsidy to the concern, which will guarantee the interest and the amortization of the debentures issued by the company.

The need of additional cable communication between Brazil and Europe, and especially between Brazil and the United States, is felt more in present rates than in any other phase of the service. The present ordinary commercial rate is about $1.05 per word for messages between Rio de Janeiro and New York City, with charges for other points in proportion. One of the most unsatisfactory phases of the matter is in the fact that this high rate, and other rates proportional for other services, make impossible such an interchange of news and similar matter as is necessary to promote closer relations between the United States and the South American countries concerned.

HARRISONBURG, VIRGINIA, RUSH SWITCHBOARD INSTALLATION.

A complete telephone exchange equipment was installed recently for the Harrisonburg Mutual Telephone Company, of Harrisonburg, Virginia, within thirty days after signing the contract. As is shown in the accompanying illustrations, the equipment includes two 3-position sections of



Harrisonburg, Va., Switchboards, 30 Days After Receipt of Order.

lamp signal common battery multiple switchboard; a 3-section rural switchboard; a combined chief operator's and monitor's desk; a wire chief's desk; a main distributing frame with lightning and sneak current protection; a relay rack and a complete power plant. The present equipment of lines is 480 and the ultimate 1,200.

Harrisonburg Terminal Room Equipment 30 Days After Receipt of Order.

The contract was awarded to the Dean Electric Company, of Elyria, Ohio, on October 14, 1908, and the exchange was in operation on November 15. Two weeks of this time was required to get the apparatus on the ground, and the remainder to install it. This is the third emergency common battery switchboard furnished by this company during 1908.

TELEPHONE AND TELEGRAPH POLES AND WIRES AS NUISANCES.

By Emerson W. Read, B. L., L. L. B.

Paradoxical as it may seem, it is yet a well-known fact in the law that poles erected by telephone, telegraph, or railway people may be nuisances and subject to abatement as such. Generally speaking, poles of such companies are erected by permission of the municipality, resolution of county supervisors, or legislative enactment. Even if resting upon such authority as this, should the poles be erected in such manner as to shut off the light, air, or draught, or obstruct highways or navigable waters, to the injury of the public or private individuals, action may be had to abate nuisance.

As shown, there are two classes of nuisances, public and private. On the distinction between the two the Cyclopedia of Law and Procedure says: "A nuisance is public where it affects the rights enjoyed by citizens as part of the public, that is, the rights to which every citizen is entitled, whereas a private nuisance is anything done to the hurt, annoyance, or detriment of the lands, tenements, or hereditaments of another, and not amounting to a trespass; thus, any unwarrantable, unreasonable, or unlawful use by a person of his own property, real or personal, to the injury of another constitutes a private nuisance. It will thus be observed that the difference between public and private nuisances does not depend upon the nature of the thing done, but upon the question whether it affects the general public or merely some private individual or individuals, and so the same act or structure may be a public nuisance and also a private nuisance as to a person who is thereby caused a special injury other than that inflicted upon the general public; while, on the other hand, the fact that a nuisance injures a great many persons does not make it a public nuisance, where the injury is to the individual property of each person and not to the general public as such."

From this it will be seen that poles erected along high-

ways may be either public or private nuisances. A pole erected outside of the sidewalk line, based in a gutter, causing drained surface water to back up and overflow sidewalk and street, can readily be classed as a public nuisance. A pole carrying a mass of cross-arms, pendant insulators, and a web of wires may render itself a nuisance by shutting off the light to one's windows or roaring and screaming in the customary winds.

The commonest manner by which poles are rendered nuisances is by the obstruction of highways. Poles exceeding the size limits authorized by the franchise have been held nuisances per se. "When the poles erected by a telegraph company are such as are necessary either in size or height, and the right to erect and maintain them is given by the Legislature, so far as they are within that authority they cannot be alleged to be a nuisance or an unlawful obstruction on the street, and to that extent the right to maintain them is legalized; but whenever such right is exceeded either by reason of the size or height of such poles the act is unauthorized, and violates the implied restraint created by the Statute, and is the legal subject of an action of redress." This holding followed an action by the people in New York to restrain a telephone company from erecting poles in a public street, constituting a nuisance and obstruction. (People vs. Metropolitan T. & T. Co., 31 Hun. 596.)

This contention by municipalities that poles and wires constitute a nuisance must be actually shown before abatement can be had. An action to abate a nuisance is not a proper method of ridding public streets of poles lawfully there but undesirable to the municipality. This scheme was attempted in New Jersey in the case of Brigantine vs. Holland Trust Company No. 2. Basing its authority solely upon its right as a municipality to general supervision and control over public streets, the municipality attempted to restrain the defendant company from stringing wires on poles twenty feet above the street level. The injunction was denied because the municipal authorities could not show that such wires were a serious impediment to travel or general public rights. Another case when the municipality did not have its own way arbitrarily is shown in American U. Tel. Co. vs. Harrison (31 N. J. Eq. 627). "Where there was no reason to believe that the wires as then overhanging the streets did in the slightest degree impede or interfere with the full and free use of the same, the company erecting their poles on private property and hanging their wires at an elevation of twenty-five feet above the roadway, did nothing but what they had a legal right to do. Therefore, the court restrained the corporate authorities from cutting the wires or otherwise unlawfully interfering with them as a public nuisance."

A good instance of the methods that may be legally adopted by municipal authorities in abating nuisances is shown in American Rapid Tel. Co. vs. Hess. An ordinance passed by the city of New York required wires to be placed underground. Should owners of such wires refuse or fail to comply with this ordinance, the Commissioner of Public Works, in the exercise of police power, should cause such poles to be cut down and the wires removed. The plaintiff having failed to remove its poles and place the wires in conduits, the poles were chopped down and the wires removed. "Its property was not taken for public use. It was simply removed from the streets, where it had been a nuisance, and the public authorities had the same right to remove it from the streets, doing no unnecessary damage, that it had to remove any other incumbrance therefrom. After the passage of the act referred to, and the building of the subways and the notice to the plaintiff, it had no right longer to maintain its poles and wires above the surface of the street. They were then there without authority and thus became a nuisance and hence the public officials had the right to remove them."

A Western case of wide importance arose over a San Francisco ordinance prohibiting companies from suspending electric wires over or upon the roofs of buildings. Judge Sawyer said in his opinion (Electric Impt. Co. vs. City and County of San Francisco, 45 Fed. Rep. 593): "That the stretching of these wires over buildings in the manner practiced, as shown by the evidence, no one, I think, can doubt after reading the affidavits, is extremely dangerous, both as being to originate fires, and as obstructions to the extinguishment of fires otherwise originated. Indeed, the danger is a matter of common knowledge. We might almost as well require strict proof of the danger of storing gunpowder, or dynamite, in, under, upon, or about our houses. The danger is of a character cognate to that of gunpowder. Should a raging fire occur, originated by the electric current or otherwise, these dangerous wires might so obstruct the efforts of the firemen, to extinguish it, as to result in the destruction of the entire city. It is certainly competent, under the police powers of the State, to suppress such dangerous erections, in the interests of the common safety of the community. . . . They (electric wires) have no more right to be there than gunpowder. The only wonder is that owners of buildings in view of the recognized danger will permit their use for such purposes. . . . I regret to be obliged by this decision to affect so seriously the interests of the enterprising parties who are endeavoring to supply our citizens with electricity for the various purposes to which it is now applied. But I cannot decline to administer the law as I find it, for the safety and security of the lives and property of the citizens of San Francisco."

EFFECT OF SINGLE-PHASE ELECTRIFICATION ON TELEPHONE LINES.

Single-phase electrification affects telegraph and telephone systems whose wires lie parallel with and in close proximity to the New Haven electric railroad. The corrective for this disturbance has proved to be simple and not costly. Briefly described, it consists of compensating transformers whose secondaries are a part of the telegraph and telephone wires and whose primaries receive their voltage from pilot wires strung on the same cross-arms as those bearing the telegraph and telephone wires, and thus having impressed upon them the same voltage, by electro-magnetic induction, as the telegraph and telephone wires. The transformer secondary voltage is approximately equal and opposite to the induced voltage on the telegraph and telephone wires and thus constantly compensates for it throughout all ranges of induction due to the single-phase wires.

An interesting commentary on the efficacy of the compensating transformer is that its use obviated the necessity of any change in the physical location of the telegraph and telephone lines within the zone of induction, and has thus been the means of removing what at first was rightly considered a very offensive attribute of the single-phase system.—Extract from "The Log of The New Haven Electrification," read by W. S. Murray. December, 1908, meeting A. I. E. E.

Electricity is produced by light acting upon rubidium, potassium, and the liquid alloy of potassium—sodium. Under the action of ordinary and ultra-violet light the electro-positive metals lose a negative charge of electricity, the effect being most pronounced on the three first-named. Before the Physical Society of London, Dr. Fleming recently showed that a difference of potential of from 0.4 to 0.8 volt exists between a platinum and a sodium potassium terminal when the latter is illuminated by a powerful beam of light. This photo-electric effect is largely dependent upon the color of the light, and especially that absorbed by the alloy. Potassium is most active with violet light, and zinc with the ultra-violet, which are likewise the waves emitted by these same metals when heated or otherwise made radiant.

CURRENT COMMENT

Fuel alcohol from one bushel of white potatoes produces one brake-horsepower in an engine, the yield being 0.8 pint. A bushel of corn yields 2.5 pints.

The force of the tides near the mouth of the Elbe River, Germany, is to be used to produce electric power for factories. A capital of $750,000 has been raised and several buildings completed at Cuxhaven.

An electric insect destroyer has been patented by two Oklahoma inventors. It consists of a frame upon which are mounted a positive and a negative electric wire. It is surmised that the luckless fly will be electrocuted when it lights upon the frame.

The cost of electric heating for domestic purposes is on a par with gas at one dollar per thousand feet if the current charge be two and one-half cents per kilowatt-hour, according to calculations presented by Mr. Max Lowenthal, at a recent discussion on electric heating.

Automatic telephone service for Honolulu is planned by the Hawaiian Telegraph & Telephone Co., which has acquired the franchise of the Standard Telephone Co. This company maintains wireless telegraph communication between the various islands, and is experimenting with the wireless telephone.

A Hawaiian hydro-electric plant is planned to utilize the 900-ft. head that will be available with the completion of the Nuuano Valley Dam, near Honolulu. The next Legislature meeting in February, is expected to make appropriations for a 12,000-horsepower plant to furnish power for pumping water and lighting Honolulu.

Silundum or solidified carbon is now employed as the heating element for electric heating devices. Carbon in any shape is electrically heated in the presence of the vapor of silicon to produce it. Its resistance to an electric current is three times that of carbon and can be heated to 1,600 degrees C. without oxidation. The material is very hard and is acid proof.

A hydraulic ram installation at Sunnyside, in the Yakima Valley, Washington, consists of eleven 6-in. rams, operating under a fall of 37.6 feet and a lift of 143.11 feet from the rams. Under these conditions, with a consumption of 5.11 cubic feet per second of drive water, 1.15 cubic feet of water per second is lifted to the point of delivery. This is stated to be a higher efficiency than has been attained by a water wheel directly connected to a centrifugal pump.

The Owens River aqueduct, to supply Los Angeles, California, with water from the Sierra Nevada Mountains, is well under way. Two electric power plants have been completed, and a telephone line has been strung the entire length of the aqueduct. The Elizabeth tunnel is being driven from both ends and from the bottom of a 183-ft. shaft. The cement plant will be in operation about January 15th. It is hoped that the work will be done for less money and in less time than was named by the city's engineers.

A telephone system is being installed on the Santa Fe Railroad's main line between Chicago and Los Angeles for the handling of train orders and other business incident to train movements. The work has commenced in Kansas. This new arrangement is not to succeed the telegraph, but merely to facilitate the work. The expected benefit to be derived from the use of the phones is that they will greatly facilitate the handling of train orders, for an average rate of forty words a minute is all that can be sent over the key, while with the telephone a man can send three or four times that amount with ease and accuracy.

Electric smelting of zinc is now being successfully accomplished at the works of the Canadian Zinc Company, at Nelson, B. C. Electric power is generated at Benning Falls on the Kootenay River and transmitted to the plant, whose present capacity is 10 tons daily.

The proper hardening heat of steel tools may be determined by the fact that the property of magnetic attraction is lost at this temperature. An English patent provides for a magnetized support which allows the steel to drop into a brine bath when the proper heat is reached.

Wireless telephony over 200 miles between Plymouth and Jamaica, L. I, was claimed by Mr. A. S. Stein, of the National Electric Signaling Company, in a talk on "Recent Apparatus for Wireless Telephony," before the Boston section of the American Institute of Electrical Engineers, recently.

The bravery of a telephone girl who stayed at her switchboard to notify the fire department that the board was ablaze, probably lessened the damage to the San Rafael, California, exchange of the Pacific Telephone & Telegraph Co. The fire was caused by short-circuited wires, and, in addition to cutting off the service for a day, it resulted in several hundred dollars' damage. The operator was Miss Pauline Euber.

An electrically propelled fire boat has been recently built to protect the wharves of Chicago. The main pumping and power machinery consists of two 660-horsepower Curtis turbines connected to 200-kilowatt direct-current generators and two-stage centrifugal pumps. In going to the fire, the pump impellers run dry. Complete control of all motors is had from the pilot house, and on a test run the captain easily handled the boat without the engineer's aid.

Telephone train operation has been endorsed by the American Railway Association, at the annual meeting just concluded, and was agreed upon after numerous severe tests. Railroad men say one of the features of the new plan will be freedom from domination by the railway telegraphers' union. The Burlington road was the pioneer in the use of telephones, and other roads are now installing the necessary plants. It is predicted that the use of telephones will soon become general among all the railroad systems.

Fishing by telephone has been invented in Norway according to Consul Louis Goldschmidt, of Nantes, France. A microphone, the role of which consists in amplifying submarine sounds, is shut up in a thin, water-tight steel box and kept in constant communication by metallic wires with a telephonic receiver installed on the fishing boat. It is stated that with this apparatus the fisherman is always informed of the approach of fish. Moreover, it is said that each kind of fish gives in the instrument a particular sound. Thus the arrival of herring is signalized by a sort of whistling; the codfish announces its arrival in the neighborhood by a sort of grunting.

Electricity in Japan is the subject of an article in a Japanese paper, transmitted by Vice-Consul E. G. Babbitt, of Yokohama, from which the following resume has been made: The authorized capital of electric undertakings in 1903, 28,500,000 yen ($14,193,000), of which 24,000,000 yen ($11,952,000) was paid up, had risen to 138,000,000 yen ($68,724,000) in 1907, of which 87,500,000 yen ($43,575,000) was paid up. The electric works undertaken chiefly represented lighting and tramways. The number of lights supplied in 1903, 365,000, had increased in 1907 to 859,143. Tokyo and Osaka require, each, 100,000 lights. Electric tramways show equal development. In 1903 the mileage was 38, which rose to 119 in 1907, and will be largely added to by construction during the present year.

JOURNAL OF ELECTRICITY
POWER AND GAS

PUBLISHED WEEKLY BY THE

Technical Publishing Company

E. B. STRONG, President
E. M. SCRIBNER, Vice-President and General Manager
A. H. HALLORAN, Secretary and Managing Editor

DIRECTORS

R. J. DAVIS A. M. HUNT E. M. SCRIBNER C. L. CORY E. B. STRONG

111 NEW MONTGOMERY ST., SAN FRANCISCO

TELEPHONE . . . . . KEARNY 918

TERMS OF SUBSCRIPTION

United States, Cuba and Mexico	per year,	$2.50
Dominion of Canada	"	3.50
Other Foreign Countries within the Postal Union	"	4.00
Single Copies, Current Month	each	.10
Single Copies, prior to Current Month	"	.25

NOTICE TO ADVERTISERS

Changes of advertising copy should reach this office ten days in advance of date of issue. New advertisements will be accepted up to noon of Monday for the paper dated Saturday of the same week. Where proof is to be returned for approval, Eastern advertisers should mail copy at least thirty days in advance of date of issue.

FOUNDED 1897 AS THE
PACIFIC LUMBERMAN, CONTRACTOR AND ELECTRICIAN

CONTENTS

The First Underhung Insulators.....*By A. S. Kalenborn* 19
An interesting contribution to the history of insulation, showing that the underhung type has been in use since 1867.

Handling Operators.....*By A. J. Shands* 20

The Legal Status and Relationship of Independent Telephone Companies.....*By A. C. Lindemuth* 20

Cable to Brazil..... 24

Harrisonburg, Virginia, Rush Telephone Installation..... 25

Telephone and Telegraph Poles and Wire as Nuisances.... 25

Effect of Single-Phase Electrification on Telephone Lines... 26

Electricity Produced by Light..... 26

Current Comment 27
Fuel Alcohol.
Utilization of the Force of the Tides.
Electric Insect Destroyer.
Cost of Electric Heating.
Automatic Telephone Service for Honolulu.
Hawaiian Hydro-Electric Plant.
Silindum.
Hydraulic Ram Installation.
Owens River Aqueduct.
Santa Fe Telephone System.
Electric Smelting of Zinc.
Hardening Tool Steel.
Wireless Telephony for 200 Miles.
Telephone Operator's Bravery.
Electrically Propelled Fire Boat.
Telephone Train Operation.
Fishing by Telephone.
Electricity in Japan.

Editorial 27
In Permanent Quarters.
Convenience in Telephony.
Underground Telephone Construction.

Books Received 28
A B C of the Telephone.
New Business Report for 1909.

Golf Tournament at Del Monte..... 28

Personal 28

Trade Catalogues 28

Patents 29

Industrial 30
A New Speed Counter.
The New Annunciator.
General Electric Supply Department Conference.

Approved Electrical Devices..... 31

News Notes 32

In Permanent Quarters.

Since the offices in the Technical Building were rendered untenantable by fire in November, of last year, the "Journal of Electricity, Power and Gas" has temporarily occupied the store at 155 New Montgomery Street, in the Greenwood Building. This week we are moving to permanent quarters in the Atlas Building, 604 Mission Street, San Francisco, and will occupy the entire ninth floor. Out-of-town readers of the "Journal" may have their mail addressed to these offices and are invited to make them their headquarters while in San Francisco. This is a fireproof building, one of the few that withstood the fire and earthquake of 1906.

Convenience in Telephoning.

Considering convenience as the chief cause of the telephone's popularity, anything that will promote ease and rapidity in its use should be fostered. Of even greater importance than good "central" service in placing outgoing calls and facilitating the movement of incoming messages, is the advantageous position of a subscriber's instrument. This should be placed where it will be most easily accessible, the importance of this factor being of more weight than the low cost of installing the set. The injudicious location of the telephone may undo all the good work of the solicitor in originally getting the business. By making telephoning easy, the subscriber will be a permanent one.

Underground Telephone Construction.

Twenty years ago, telephone conduit construction was in disfavor because of the difficulties of operation. To-day, these difficulties, chief among which are induction and retardation, have been overcome and such construction in many cities is now prescribed. Notwithstanding that the case is thus one of "Hobson's choice," nevertheless in many instances it is found much to the company's advantage to place the cables underground. This eliminates any danger of line destruction by storms and removes the cost of defense against expensive law suits for personal injury. Furthermore it withdraws any grounds for the popular complaint against aerial wires and poles which interfere with fire fighting and street traffic. Incidentally, it effectually does away with the nuisance of house-movers who do not recognize the vested rights of the owners of telephone poles and wires in the street. It also eliminates all controversy as to the right to trim trees.

Although the initial cost of conduit work is high, maintenance is correspondingly low and its life is longer than that of any other portion of the plant. The usual allowance of a fifty-year life with no junk value gives a depreciation charge of two per cent. In laying out a system it is customary to anticipate reaching every subscirber for fifteen years to come, as that is the average life of most telephone apparatus.

In entering a settled community, where there is to be a large number of parallel wires, there can be but little question as to the superiority of conduit construction.

BOOKS RECEIVED.

"A, B, C of the Telephone." Second and revised edition. A practical and useful treatise for students and workers in telephony, giving a review of the development of the industry to the present date, and full descriptions of numerous valuable inventions and appliances, together with very many illustrations, diagrams, and tables. By James E. Homans, New York. 335 pages, 266 illustrations. Theo. Audel & Co., 1901. For sale by the Technical Book Shop, 111 New Montgomery St., San Francisco.

This is an elementary treatise prepared for the beginner and general reader, all theoretical and abstruse descriptions being omitted. The book contains twenty-nine chapters, each one thoroughly covering some one feature of the subject.

After a brief historical and descriptive introduction, the author briefly outlines the theory of sound and the principles of electricity. Continuing, he describes various switchboard equipments, party lines, and private telephone lines. Considerable space is devoted to line construction and wiring, and brief accounts are given of the micro-telephone and wireless telephony. The concluding chapter contains some useful definitions and hints on telephone management.

The book can be readily understood by the non-technical reader without previous knowledge of electricity. In several instances, illustrations of antequated apparatus are given and there are a few typographical errors, such as designating the section on wireless telephony as "Chapter Thirty-eight" instead of twenty-eight. But on the whole it is an excellent book to be put in the hands of the beginner.

"New Business Report for 1909." Published by Frank B. Rae, Jr., 74 Cortland St., New York City, for the National Commercial Gas Association. 136 pages, well illustrated, handsomely printed and bound. Price $3.00. For sale by Technical Book Shop, 111 New Montgomery St., San Francisco.

"It consists of contributed articles from men successful in cultivating an art of great usefulness. Here will be found the experiences of men who have not been content to follow precedent, but who have had sufficient courage to apply a little science and some brains to the improvement of an every-day service." The volume is edited by Mr. George Williams and includes the following articles: "Initiative," Elbert Hubbard; "Success in Salesmanship," Charles N. Crewdson; "The Solicitor's Opportunity," A. B. Leach; "To the Young Man," Leslie M. Shaw; "The Right Business Spirit," Waldo Pondray Warren; "Commercial Plans Require Judgment," Alex. J. Campbell; "New Business Don'ts," M. C. Osborn; "The Newspaper as an Ally," Charles M. Cohn; "The Necessity of a Higher Standard," C. W. Hare; "Advertising, Printed and Personal," La Forest F. Blyler; "Promotion Not Competition," George Williams; "Illuminating Engineering as a Business Getter," E. Leavenworth Elliott; "Show Window Illumination," T. J. Litle, Jr.; "Hints for Arranging a Show Room," C. E. Moore; "Organization of New Business Department," E. N. Wrightington.

GOLF TOURNAMENT AT DEL MONTE.

The electrical jobbers of the Pacific Coast have a very pleasant habit of meeting at irregular intervals, for getting business volts and amperes, for the time being, and engaging in sports after the manner of the ancients in the prosperous days of Greece and Rome. Just such a meeting will be held at Del Monte, California, on January 16th, 17th and 18th, when the jobbers from Seattle, Portland, San Francisco and Los Angeles will gather at the Hotel Del Monte and a most desperate struggle will take place for supremacy in golf, the

national game of Scotland. A preliminary round will be played to establish the necessary handicaps after which friendship will cease and blood will tell. The prize is a handsome silver cup and the contest between the delegations from different cities promises to be a warm one.

PERSONALS.

A. L. Havens, the Los Angeles representative of Pierson, Roeding & Co., of San Francisco, is in town.

Edward F. R. Vail, president of the Home Telephone Co., of Santa Barbara, California, was in San Francisco this week.

B. B. Becket, formerly engineer with the Ocean Shore Railway, and recently returned from Central America, has joined the sales force of the Electric Storage Battery Co.

E. S. Utley, in charge of the incandescent lamp department of the Western Electric Company, San Francisco, has returned from a two weeks' vacation trip to Riverside, California.

E. J. Koppitz, sales engineer with the San Francisco office of the Western Electric Co., was married to Miss Maude Davis, of San Francisco, on January 2, 1909, and is now receiving the felicitations of his friends.

C. W. Scott, manager of the San Francisco office of the H. W. Johns-Manville Company, will leave for the East, on January 23d, to attend the regular convention of managers of his company, which will be held in New York early in February.

TRADE CATALOGUES.

Bulletin No. 82 from the Wagner Electric Manufacturing Company, of St. Louis, Mo., is devoted to the new Wagner Polyphase Motors. It contains a frank discussion of the relations between ratings and overloads and between starting torque and efficiency.

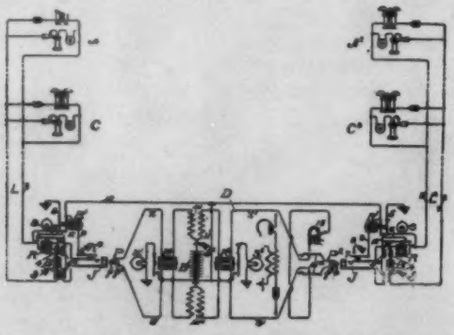
Bulletin No. 15 from the Welsbach Company, of Gloucester, N. J., is a reprint of an excellent paper on "Modern Gas Lighting," read by Mr. M. G. Whitaker before the architects and builders of Detroit, Mich.

In pamphlet No. 3715, just issued by the General Electric Company, are described mercury arc rectifiers for telephone battery charging. The points of superiority which this outfit is claimed to have over the general motor-generator sets, rotary converters, and electrolytic rectifiers for charging central telephone batteries, are reliability, freedom from line disturbances, high efficiency, low first cost, low cost of maintenance, simplicity of operation, noiseless operation, and economy of floor space. The pamphlet contains a detailed description of the outfit, with connection diagrams and dimensions.

PATENTS

TELEPHONE SYSTEM. 907,224. William W. Dean, Chicago, Ill., assignor to Kellogg Switchboard & Supply Company, Chicago, Ill.

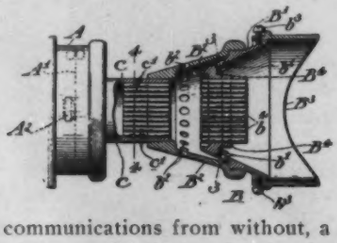
In a telephone system, the combination with a telephone line, or a cord circuit to connect therewith, a relay and a battery permanently connected in the line, the said



relay being under the control of the subscriber at all times, a ground tap adapted to be connected with the talking circuit and controlled by said relay, and telephonic apparatus associated with the cord circuit having its operation affected by current flowing over a circuit formed of a portion of the said talking circuit and said ground tap.

DEVICE FOR TRANSMITTING SOUND-WAVES. 907,320. Arthur Dare, Philadelphia, Pa.

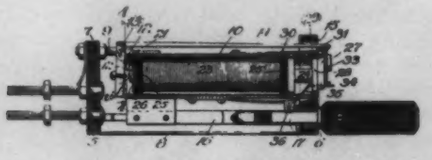
A telephone transmitter comprising two connected conical chambers, the first of which is adapted to act as a mouthpiece, and the second as an expansion chamber, the first chamber being provided with annular openings communicating with the second chamber, and the latter having similar open-



ings forming communications from without, a series of non-resonant tubes interposed between the chambers, a pipe leading from the second chamber to a box containing the diaphragm and its mechanism, a series of non-resonant tubes contained within said pipe and means including a lever and connecting link for moving the chambers and consequently varying the distance between the non-resonant tubes.

TELEPHONE-DROP. 907,062. Tiodolf Lidberg, Chicago, Ill., assignor to Swedish-American Telephone Company, Chicago, Ill.

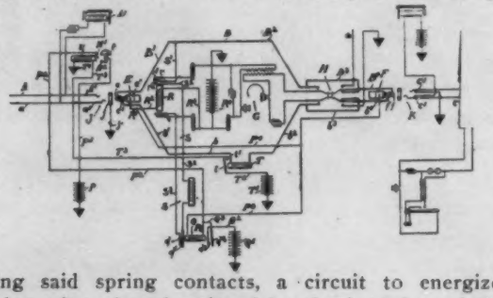
In a telephone-drop, a cylindrical coil-casing open at both ends, an electro-magnet comprising a coil arranged for



insertion and withdrawal through the front end of said casing, a shutter support inseparably fixed thereto and shutter latching means secured to said casing and controlled by said electro-magnet.

PRIVATE-BRANCH-EXCHANGE TELEPHONE SYSTEM. 906,602. Frank Arens, Cincinnati, Ohio.

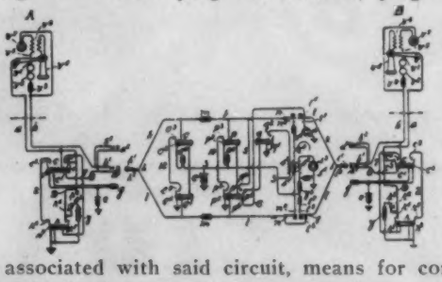
In a private-branch-exchange system, in combination with the cord mains, the answering jack and plug, the calling jack and plug, and the supervision signal, a shunt circuit connecting the mains, said circuit being interrupted by two spring contacts, the first of said spring contacts being normally open, and the second, normally closed, relays for



actuating said spring contacts, a circuit to energize the first relay adapted to be closed by the insertion of the answering plug, a circuit to energize the second relay adapted to be closed upon the operation of the supervision signal, a supplemental circuit connected with the second relay and terminating in the answering plug, said circuit being normally open, and a spring contact adapted to close said supplemental circuit, said spring being operated by said second relay.

TELEPHONE SYSTEM. 907,581. Alfred H. Dyson, Chicago, Ill., assignor to Milo G. Kellogg, Chicago, Ill.

An electric signaling system comprising a circuit extending from one station to a second, a source of current included in said circuit, a signal associated therewith, an electro-magnet normally under the control of the first station for causing the display of said signal, a second electro-magnet for destroying said control, plug and jack



contacts associated with said circuit, means for completing a talking circuit through said plug and jack contacts, an energizing circuit for said second electro-magnet local to said second station and including talking contacts of said plug and jack and being normally open at a second point, and means under the control of the first station for closing said energizing circuit at said latter point.

WATER-WHEEL. 906,754. Arnold Tschirgi, Sheridan, Wyo.

The combination of a dam provided with a wheel space, end plates arranged within the wheel space, the end plates being spaced from the walls thereof and provided with flanges which are secured thereto, a bulkhead supported upon the end plates, a wheel mounted between the end plates and provided with swinging buckets, a circular plate slidably mounted upon one of the end plates, a ring upon the circular plate, links connecting the ring to the buckets of the wheel, and means for moving the circular plate into a concentric or eccentric relation with the axis of the wheel, the dam being provided with means for delivering water to the wheel and discharging it therefrom.

INDUSTRIAL

A NEW SPEED COUNTER.

The Veeder Manufacturing Company, of Hartford, Conn., has just put on the market a new speed indicator, which is quite unique in design, being entirely different from anything else for the same purpose now on the market. It uses for the registering apparatus one of the revolution counters, so familiar to all users of counters, and which requires a complete revolution of its shaft to register one unit. The new indicator is capable of being run up to 10,000, which is capacity enough for all ordinary cases.

The limit of speed for which the instrument is recommended is about 5,000 revolutions per minute. It can be used at higher speeds, but the wear is much greater at excessively high speeds.

To determine the actual number of revolutions, the reading of the counter must be taken before starting the count, as no setback arrangement is provided for bringing the register back to zero. This saves the bother of setting the counter back and is not inconvenient; any setback now made renders the instrument inaccurate. It is a very easy matter to jot down the reading of the register at the beginning and at the end of the period for which the count is taken, and the difference between the two readings gives the count for the period desired. The counter works equally well in either direction. When run one way, it subtracts; when run the other, it adds. In either case the difference of the readings gives the actual count.

The counter is extremely compact and weighs but a few ounces. It is comfortable to hold in the hand and its readings are reliable because of the direct reading index.

Where it is desirable to use a counter in connection with electrical machinery, the rubber tip shown is provided, which effectually insulates the counter from any current there may be in the machinery.

THE NEW ANNUNCIATOR.

A valuable improvement in the well-known magnetized needle form of annunciator is now being placed on the market.

In the old type of instrument, false indications not infrequently resulted because the needles came within the influence of the magnet cores while vibrating after being reset.

In the new type, the needles are attached to the face-plate instead of to the setback rod. A V-shaped slot in the setback bar engages a lug on the needle which passes through the plate, thus returning the needle to its normal vertical position. No resetting oscillation is possible, because the V-shaped slot brings the needle to immediate rest.

Another important feature of the new annunciator is that raising the setback rod does not impart to the needles any general movement. In early types, where resetting "jiggles" all the needles, a heavily charged magnet core often would re-attract a needle, causing false indication.

The bell mechanism is attached to a frame hinged to the case. This allows the testing of the bell or lines to be done without the removal of the bell from the case. The case is plain with round corners, well finished, and attaches to the wall with four screws. The terminals have lugs to prevent the wire slipping and are soldered to the wires from the magnet coils.

A telephone terminal is provided on the type "C," which enables telephones to be connected to the system, and this is accomplished with no more wiring than that used for the ordinary annunciator. If the building has been wired, a telephone can be substituted for the push button at any outlet and a telephone for the attendants' use placed in the same room with the annunciator. Where the householder can get such convenient service so inexpensively, the electrical contractor can of course find profitable business.

This new annunciator is also made with the operator's set attached to the case. There are a number of different types of cases as well as self-setting and elevator styles. It has been named the "Hub" and is manufactured by the Electric Goods Manufacturing Company, Boston, Mass.

SUPPLY DEPARTMENT CONFERENCE GENERAL ELECTRIC COMPANY.

On January 4th, 5th and 6th the Pacific Coast Supply Department of the General Electric Company held its annual meeting at the Fairmont Hotel, San Francisco, for the discussion of subjects of interest to that department. The meeting closed with a dinner at the Fairmont Hotel on the night of January 6th, at which Mr. T. E. Bibbins, manager of the Department, presided in his usual happy manner.

The meeting was one of the most successful in the experience of that company and the many brilliant talks at the concluding dinner indicated the possibilities which can be developed in the supply man under proper leadership.

In addition to the Pacific Coast force of the department there were present Mr. F. G. Vaughen and Mr. G. C. Osborne of the Eastern organization, and their presence aided materially in making the convention a success.

LIMIT OF SAFETY IN STORED COAL.

The Coal Department of the Arthur D. Little Laboratory, Boston, has found instances where a small coal pile cooled down after being as hot as 165 degrees Fahrenheit. This was probably a rare occurrence, as the temperature generally increases rapidly as the coal heats up above 150 degrees, and there is no doubt but that when 212 degrees Fahrenheit is reached, the coal must be moved or some steps taken to cool it, in order to prevent fire. Temperatures as high as 485 degrees Fahrenheit have been observed, and at this temperature the coal ignited when exposed to the air.

GROUND TROUBLE.

A Seattle telephone user has been bothered by the ringing of his telephone bell whenever the electric light was turned on. Investigation showed that the fixture wiring had been grounded to a gas-pipe, and the telephone had been grounded to a water-pipe, enough current being picked up to ring the telephone bell. The trouble was cleared by removing the telephone ground from the water-pipe.

The examination will consist of: Mathematics, materials, calculations, drafting, and training and experience. Competitors must possess knowledge that will enable them to design the engines and all machinery in light-house tenders.

APPROVED ELECTRICAL DEVICES

CONDUIT BOXES.

"Pratt" pressed-steel, square type outlet boxes with covers, galvanized or enameled finish. Approved Dec. 14, 1908. Manufactured by

Pratt-Chuck Co., Frankfort, N. Y.

CONDUIT BOXES, FLOOR OUTLET.

"T. & B." Watertight Floor Outlet. A cast-iron box with a brass plate and cap. Hubbell plug and receptacle. 10 A., 250 volts. Approved Dec. 7, 1908. Manufactured by

Thomas & Betts Co., 299 Broadway, New York, N. Y.

FLEXIBLE CORD, PENDANT.

Marking: Two green cotton threads running parallel, with wire between the rubber insulation and braid. Approved Dec. 18, 1908. Manufactured by

Bishop Gutta-Percha Co., 420 E. 25th St., New York, N. Y.

LAMP ADJUSTERS.

Harley's No. 1 Electric Light Holder. Two sliding wooden strips having the upper strip secured to a mounting block by a ball and socket joint and with the flexible cord running in a groove cut on the inner surface of the lower strip. Approved Dec. 18, 1908. Manufactured by

Harley Machine Co., 92 Hayden Ave., Springfield, Mass.

MISCELLANEOUS.

Mercury Arc Rectifiers for converting alternating to direct currents; outfits supplied for alternating-current circuits of 110, 220, and 300 volts, with direct-current capacities up to and including 50 amperes. Also mercury arc rectifier panel for moving-picture machines, 220 volts. For telephone battery service this apparatus may include G. E. type H transformer of unity ratio, to be inserted as an insulation between alternating and direct current circuit grounded neutral and ground return of the telephone system. Compensating reactance case must be mounted on base of slate or other non-combustible insulating material when installed on floor or wall of combustible material. Approved Dec. 18, 1908. Manufactured by

General Electric Co., Schenectady, N. Y.

"G. E." Buzzer, alternating-current circuit, 2 A., 125 volts. For use only in series with incandescent lamps to indicate when lamps are left with current on. Approved Dec. 7, 1908. Manufactured by

General Electric Co., Schenectady, N. Y.

RECEPTACLES FOR ATTACHMENT PLUGS.

G. E. cleat concealed and flush types of receptacles with "pull-off" attachment plugs, 6 ampere, 250 volts. Cat. Nos. 49488-49490, inclusive. Approved Dec. 17, 1908. Manufactured by

General Electric Co., Schenectady, N. Y.

Ten amperes, 250 volts. Surface, cleat type, Cat. Nos. 5512-5514, inclusive. Surface, concealed type, Cat. Nos. 5426-5428, inclusive. Surface, moulding type, Cat. Nos. 5540-5542, inclusive. Surface, fielding, Cat. Nos. 5560-5584-5585. Flush wall type, Cat. Nos. 5415-5418, inclusive; 5443-5446, inclusive; and "Polarity," Cat. No. 5565. Floor box type, Cat. Nos. 5506-5508, inclusive; 5469-5471, inclusive; and 5561-5563, inclusive, when installed in approved wall boxes in side walls, or when entirely enclosed in approved water-tight floor outlet boxes. Approved Dec. 15, 1908. Manufactured by

Harvey Hubbell, Inc., 35 Organ St., Bridgeport, Conn.

SWITCHES, KNIFE.

All capacities, 250 and 600 volts, with or without fuse extensions. Approved Dec. 15, 1908. Manufactured by

E. G. Bernard Co., Troy, N. Y.

ROSETTES, LINK FUSE.

"Bryant, Jr." 2 amperes, 125 volts. Cleat type, Cat. No. 1501. Concealed type, Cat. No. 1502. Conduit box type, Cat. No. 368. Also "Bryant" combined cleat and fusible rosette, Cat. No. 965. Approved Dec. 28, 1908. Manufactured by

Bryant Electric Co., Bridgeport, Conn.

ROSETTES, FUSELESS.

"Bryant," 3 amperes, 250 volts, KP style. Cleat, concealed and moulding types, Cat. Nos. 1499, 1710-1497. "Junior" style, cleat, concealed, conduit box and moulding types, Cat Nos. 1999, 297, 369, 299. Also cleat type, Cat. No. 869, with porcelain sub-base, Cat. No. 1247. Approved Dec. 18, 1908. Manufactured by

Bryant Electric Co., Bridgeport, Conn.

SOCKETS, STANDARD.

Brass shell, key and keyless, Cat. Nos. 157, 0157, 357, 0357, 457, 0457, 537, 0557, and 460 to 465, inclusive, with metal keys; and "Snap Cap," Cat. Nos. 440 to 445; also all above types with shade-holders attached. Approved Dec. 29, 1908. Manufactured by

Pass & Seymour, Inc., Solvay, N. Y.

G. E. brass shell, key type, lock socket, Cat. No. 58951, 50 C. P., 250 volts. Sockets with revolving screw shells from which lamps cannot be removed without access (by means of special keys) to certain stops on the interiors. Approved Dec. 2, 1908. Manufactured by

General Electric Co., Schenectady, N. Y.

RECEPTACLES, STANDARD.

"P. & S." Wall Sockets, 3 amperes, 250 volts (keyless), and 50 C. P., 250 volt (key), brass shell, Cat. Nos. 387, 0387, 455, 456, and 467, 468, 469 with metal keys. Porcelain shell, Cat. Nos. 2371, 02371, 237, 0237, 247, 0247. Approved Dec. 30, 1908. Manufactured by

Pass & Seymour, Inc., Solvay, N. Y.

SWITCHES, PUSH-BUTTON FLUSH.

"Marshall" Push-button flush switches, single-pole and three-way, 10 A., 125 volt, 5 A., 250 volt, Cat. Nos. 1001, 1003. Double-pole, 10 A., 250 volts, Cat. No. 1002. Approved Dec. 7, 1908. Manufactured by

Marshall Electric Co., 301 Congress St., Boston, Mass.

SWITCHES, SURFACE SNAP.

"G. E." with or without indicator, closed or slotted bases. Single-pole, 3 A., 250 V.; 5 A., 125 V.; Cat. Nos. 59873-74, 60294-95. 5 A., 250 V.; 5 A., 125 V.; Cat. Nos. 60950-53. Double-pole, 5 A., 250 V.; Cat. Nos. 60950-53; 10 A., 250 V.; Cat. Nos. 60451-54. Three-way, 3 A., 250 V.; 5 A., 125 V.; Cat. No. 60955; 5 A., 250 V.; 10 A. 125 V.; Cat. Nos. 60455-56. Four-way, 2 A., 250 V.; 5 A., 125 V.; Cat. Nos. 60458-59. Two-circuit, 2 A., 250 V.; 5 A., 125 V.; Cat. Nos. 60460-63. Three-circuit, 2 A., 250 V.; 5 A., 125 V.; Cat. Nos. 60464-07. Approved Dec. 7, 1908. Manufactured by

General Electric Co., Schenectady, N. Y.

"Perkins" three-pole snap switches with Vulcabeston commutators. 15 A., 125-250 V., Cat. Nos. 2025, 2026, 2045, 2046. Approved Dec. 16, 1908. Manufactured by

Perkins Electric Switch Manufacturing Co., Bridgeport, Conn.

SWITCHES, SURFACE SNAP, SUB-BASES.

"Arrow E" porcelain sub-bases for surface snap switches Cat. Nos. 6330, 6331, 6332, 6335, 6336, 6337, and 6340. Approved Dec. 18, 1908. Manufactured by

Arrow Electric Co., 619 Capitol Ave., Hartford, Conn.

NEWS NOTES

TELEPHONE.

MILWAUKIE, ORE.—This place will have a telephone system soon. No names mentioned.

MONROE, WASH.—A move is on foot to extend the line of the Independent Telephone Company to Cherry Valley.

EUGENE, ORE.—Negotiations are in progress with the Home Telephone Company of Portland for the establishment of that system here.

TULARE, CAL.—The Pacific Telephone & Telegraph Company has taken over the system of the Home Telephone Company, of this county.

FARMINGTON, UTAH.—The Davis County Independent Telephone Company has organized and they expect to cover all of Davis County.

BELLINGHAM, WASH.—It is announced that $50,000 will be expended by the Home Telephone Company in the extension of its service lines in this city.

WINNEMUCCA, NEV.—The residents of Quin River Valley have subscribed the sum of $2,950 towards the building of a new telephone line from Haviland's Station to McDermitt.

BUTTE, MONT.—The Inter-Mountain Construction Company expects to do considerable work this spring, and will install new boards in Helena, Deer Lodge and other points

MT. VERNON, WASH.—The citizens of this city have signed up with the Farmers' Mutual Independent Telephone Co. of Everett, Wash., to use their service from the first of the year.

MODESTO, CAL.—The Sylvan Rural Telephone Company is completing the construction of its lines in and around Modesto, and expect to give rural service in the next thirty days.

GOLDENDALE, WASH.—The Goldendale Telegraph and Telephone Company will place a new switchboard in their exchange immediately, and otherwise thoroughly overhaul their system.

BERKELEY, CAL.—Manager F. E. White, of the Pacific States Telephone & Telegraph Company, in Berkeley, has announced that the company will lay more than 100,000 feet of cable in that city in the spring.

BOISE, IDAHO.—The Independent Long Distance Telephone Company is contemplating overhauling its exchanges at Nampa, Payette and Weiser and putting in new common battery switchboards this spring.

ANACORTES, WASH.—W. J. Phillips, division superintendent of the Pacific Telephone Company, with headquarters at Portland, was in the city recently mapping out improvements that the company proposes to make in the near future.

ONTARIO, ORE.—A telephone company, to be known as the Farmers' Mutual, was organized recently by the farmers living about Fruitland. B. F. Tussing is president of the company and H. E. Smith secretary. The plan is to install the system at once.

TENINO, WASH.—Negotiations have just been completed which will combine the telephone exchange, the Light & Power Company and the water works under one general office and plant roof, under the ownership and management of W. Dean Hays and S. W. Fenton. The plans for the consolidation of the plants and management include extensive improvements to all three systems.

ANACORTES, WASH.—The Farmers' Mutual Independent Telephone Company, of Everett, Wash., have purchased a new common battery multiple switchboard for this station. This board was shipped the first of the year and will be in operation about the first of February.

SILVERTON, ORE.—The Interurban Telephone Company have placed the order for a new multiple switchboard with the Dean Eelectric Company, Elyria, Ohio. This board will soon be shipped, and the Interurban Telephone Company expects to give as fine service as can be had in the State of Oregon.

TONOPAH, NEV.—An agreement has been reached whereby the Postal Telegraph Company will use the lines of the Southern Nevada Telephone & Telegraph Company, the former company having now opened offices in this city. The Postal Company will soon be forwarding messages to the Coast.

SAN FRANCISCO, CAL.—Joseph Harris, of Chicago, president of the Automatic Electric Company, and who is now in this city, states that the installation of 65,000 automatic telephones for the Home Telephone Company in San Francisco, will begin in March. Mr. Harris states that 15,000 telephones, switchboards and other appliances representing an investment of $1,000,000, are now on their way to this city, an additional 50,000 telephones to be shipped later. The Home Company of this city will erect long-distance lines along the Coast, to parallel the lines of the Pacific Telephone & Telegraph Company. Harris announces that the Home Company will be ready to begin operations by the middle of the year.

ILLUMINATION.

CANBY, ORE.—A light and power franchise has been granted to M. J. Lee.

LAPWAI, IDA.—J. W. Fenderson, a local business man, is preparing to install an electric light plant.

LEWISTON, IDA.—W. H. Bourke of Spokane has asked the city council for an electric light franchise.

VANCOUVER, B. C.—The North Vancouver Gas, Heat & Gas Power Company, Ltd., has asked for a franchise.

BREMERTON, WASH.—Peninsular Light & Power Company submitted an ordinance for a franchise for electric light and power plant.

HOQUIAM, WASH.—It is announced that the Grays Harbor Railway & Light Company will soon replace its wooden light poles with steel and will install cluster lights.

MANILA, P. I.—At a recent session of the Municipal Board of the city of Zamboanga it was indicated that there is a strong possibility of the immediate installation of a modern electric lighting plant in that city.

QUINCY, CAL.—The permanent machinery to be installed in the plant of the Indian Valley Electric Light & Power Company at Greenville has arrived and will be established as readily as weather conditions will permit.

MODESTO, CAL.—The bid of $225 of the La Grange Light & Power Co. for a franchise to erect and maintain poles and wires for the transmission of electrical power for light, heat and power, has been accepted by the City Council.

PHOENIX, ARIZ.—F. H. Ensign, general manager of the Phoenix Gas & Electric Company in this city, has just returned from Los Angeles and states that he has let the final contract for electric machinery for the new station of the company in Phoenix. The equipment is to be furnished by the General Electric Company.

TRANSMISSION.

CORNING, CAL.—Notice of appropriation of 3,000 inches of water from South Digger Creek, has been filed by A. T. Forward, vice-president of the Sierra Electric Power Company. The water is to be used for generating electrical power.

HONOLULU, H. T.—The plans for the proposed power house in Nuuana Valley, which will furnish electricity for the lighting system of Honolulu, and which will also fill reservoirs with artesian water for domestic use, have been completed, and operations will begin immediately.

CHICO, CAL.—Thirty-day options on large tracts of land in Big Meadows, Plumas County, California, have been taken by the Great Western Power Company, with the evident intention of erecting upon the land the second of its proposed string of power plants along the Feather River.

OAKLAND, CAL.—The new generating plant of the Pacific Gas & Electric Company in this city has been completed, having been entirely constructed in five months' time. The new plant has a 9,000-kilowatt capacity, generated by 12,000-horsepower steam turbines, and was constructed at a cost of $500,000.

CHICO, CAL.—The Sierra Electric Power Company, recently incorporated at Oakland, is to enter the field here in competition with the Pacific Gas & Electric Co., headquarters having been established in this city. The company proposes to erect its power plant on Digger Creek, Tehama County, California, fifty miles north of Chico. Water rights have been secured.

OAKLAND, CAL.—The California Electrical Generating Company has issued bonds to the amount of $5,000,000. This company has valuable holdings in the Sierra Nevada Mountains, and plan to bring electrical power to the cities bordering San Francisco Bay. It is declared by the company officials that a steam generating electrical power plant will be erected in Oakland in the immediate future. The corporation is capitalized at $7,500,000, entirely subscribed by the Board of Directors. Guy C. Earl is president, and W. H. Spaulding is secretary, the remaining directors being Charles W. Walter, Perry M. Reeves, Herold P. Pitts, Chester H. Pennover, Charles H. Benton, Charles E. Minard, Thomas B. Pheby, Jr., Thomas V. Maxwell, and Ernest W. D'Obrain.

SAN FRANCISCO, CAL.—The Tuolumne Water Supply Company, which has assumed control of the large land holdings of William Hammond Hall, in the Hetch-Hetchy Valley, and which are essential to San Francisco's municipal water supply project, has incorporated here, with Jesse W. Lilienthal, Alexander M. More, and Henry H. Hart as directors. William Hammond Hall's lands comprise about 1,000 acres and were recently offered to San Francisco for $200,000, with the understanding that he retain the power rights. The Supervisors wished to take the power rights over also, but this proposition Hall refused. The new company has been organized for irrigation and power purposes, but Lilienthal asserts that the concern will deal fairly with the city.

OAKLAND, CAL.—Plans have been completed by the Great Western Power Company for the erection on the water front in this city, for a $1,000,000 electrical generating plant, to be used as an auxiliary to the hydro-electric station of the company, and as a reinforcement in an emergency. Contracts for the piling and other preliminary foundation work have already been closed, and operations will begin within a few days. It is expected that the plant will be in operation within seven months after the work of construction is commenced. The plant is to be modeled after that of the Chicago Edison Company, the engines to be of steam turbine type, producing a current aggregating 15,000 kilowatts and about 20,000 horsepower. This will be the first steam-turbine plant of this magnitude in California. The company expects to ultimately duplicate the plant.

PENDLETON, ORE.—The Peacock Milling Company has filed on 5,000 inches of water on the Walla Walla River, which will be used to generate electrical power.

SPOKANE, WASH.—Wm. A. Nicholls, president of the Big Bend Transit Company, announces that his company owns a power site on the Spokane River, capable of developing 25,000 horsepower, and will build at once an electric plant, starting with 10,000 horsepower.

WATERWORKS.

POMONA, CAL.—The Consolidated Water Company will expend more than $30,000 on its new high-pressure water system.

SAN JUAN, CAL.—The Board of Trustees of San Juan have ordered a proposed pipe line surveyed and advertised for bids.

LOS ANGELES, CAL.—The water department has awarded the contract for 5,000 meters to the Neptune Meter Company.

VENTURA, CAL.—The bid of P. Charlebois, amounting to $2,515, for 10,500 feet of 3-inch Standard black pipe, has been accepted by the Supervisors.

WAILUKU, H. T.—Data and surveys have been prepared for a proposed pipe line to carry water from the Kaalau mountains to the fields of Kula, and a report submitted.

LOS ANGELES, CAL.—Advertisements for bids in respect to a supply of steel piping in various sizes has been ordered by the City Council. The bids are to be opened on January 19th.

LOS ANGELES, CAL.—The Board of Public Works awarded the contract for the construction of the Antelope Valley division of the Owens River aqueduct to Perry A. Howard, at a cost of $529,008.

SACRAMENTO, CAL.—R. G. Hanford, a capitalist, is planning to offer Sacramento a supply of pure water, which he will probably divert from the American River and bring to Sacramento by means of pipe lines.

TURLOCK, CAL.—A special bond election to secure funds with which to construct sewers, sewer plant, lay pipes, construct a water plant, and lay mains will be held on January 18th. The proposed bonds call for a total of $53,000.

BERKELEY, CAL.—To secure water supply through the control of the drainage lands of Strawberry Creek, options on 700 acres of land have been secured by the University of California authorities. The land purchased will cost nearly $1,000,000.

ALAMEDA, CAL.—Louis Titus, president of the Peoples' Water Company, has assured the City Council that his company will keep his promises made several months ago to the effect that $7,000 worth of new pipes would be installed in the city.

SONORA, CAL.—Marsden Manson has transferred to San Francisco all his rights, titles, and interests to the filings of water rights of the Tuolumne River and Eleanor Creek in Tuolumne County. The filings were made under the official direction of Manson as the City Engineer of San Francisco.

GRIDLEY, CAL.—Sealed bids for furnishing the materials, erecting and constructing a waterworks and electric light building for Gridley will be received by the clerk of the Board of Trustees until January 11, 1909. Sealed bids for erecting and installing a pumping plant in the same city will be received until February 23rd.

LOS ANGELES, CAL.—In the third annual report of the accounting department of the Owens River Aqueduct, it is shown that the disbursements and cash on hand for the year ending November 30th, amounted to $3,201,049.97. The cash on hand November 30, 1907, amounted to $45,141.95, and the sum received from the sale of bonds was $3,092,776.61. The total Aqueduct construction account amounted to $3,542,860.92.